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LIQUID HONING

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In the liquid-honing process, a stream of abrasive-containing liquid is directed, by compressed-air pressure, against the surface of metal parts. This process imparts to the metal surface a finish resembling that produced by fine pickling. The addition of anticorrosion chemicals to the honing liquid makes it possible to obtain metal surfaces which have high corrosive resistance.

Liquid honing permits the use of various grades of abrasives (ranging from 80 to 2,500 mesh), various proportions of abrasives and anticorrosion chemicals, varying degrees of the compressed-air pressure, and emulsions of varying consistencies. The flexibility of this process permits application to various fields of technology, all the way from cleaning sand and dirt off cast parts to the final polishing and finishing of minute metal parts. State standard No 2789 - 45 established 10 - 11 degrees of fineness of metal surfaces and established a margin of error of 3 - 5 for parts subjected to liquid honing. A metal surface can be given a fine finish by gradually decreasing the amount of abrasive in the liquid mixture and by using a finer abrasive.

Heavier grade abrasive can be used satisfactorily in an intermediate process, such as cleaning the inner surfaces of complex castings. The use of liquid honing for this purpose greatly increases savings in both manpower and cost of the part. This type of honing can also be used for fine work, such as the preparation of surfaces before the application of a metal film or for the removal of scale after heat treatment (for example, the teeth of gears).

It is recommended that the liquid-honing process be widely utilized in Soviet industry as it gives excellent results regardless of the hardness of the metal or the complexities of the surfaces. The equipment is simple and can be adapted to large mass-production facilities as well as small machine shops.

The liquid-honing apparatus designed by the author can best be utilized in small shops. The basic components of this equipment are the following: (1) chamber in which the metal part is subjected to honing blast; (2) tank containing the mixture of liquid and abrasive; (3) pipe conducting the abrasive mixture from tank to chamber; (4) foot pedal which controls the flow of the abrasive mixture, (5) plug. The chamber has two openings which permit regulation of the

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direction of the abrasive blast as well as insertion and removal of the part being processed. The operator can watch the progress of the process through a window. An electric light supplies illumination for the chamber. While the apparatus is being operated, the discharged abrasive fluid is collected in a pan and after enough has been collected it is returned to the tank.

A small vibrator is attached to the tank. This vibrator constantly shakes the tank, thus ensuring a homogeneous mixture. A belt connects an electric motor to the vibrator. A constant pressure of 5 - 6 atmospheres is maintained in the tank by hooking it up to the plant's general compressed-air circuit. At this pressure the emulsion is blasted out at a speed of 30 meters per second. The pipe is equipped with various types of nozzles, depending on the type of metal and the size and shape of the metal part being processed.

(NOTE: A diagram of the liquid-honing apparatus is available in the original document at CIA.)

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